Quality Improvement in Public Health, Module Two: Experiencing the QI Method

July 13, 2011

Public Health Performance Management Centers for Excellence

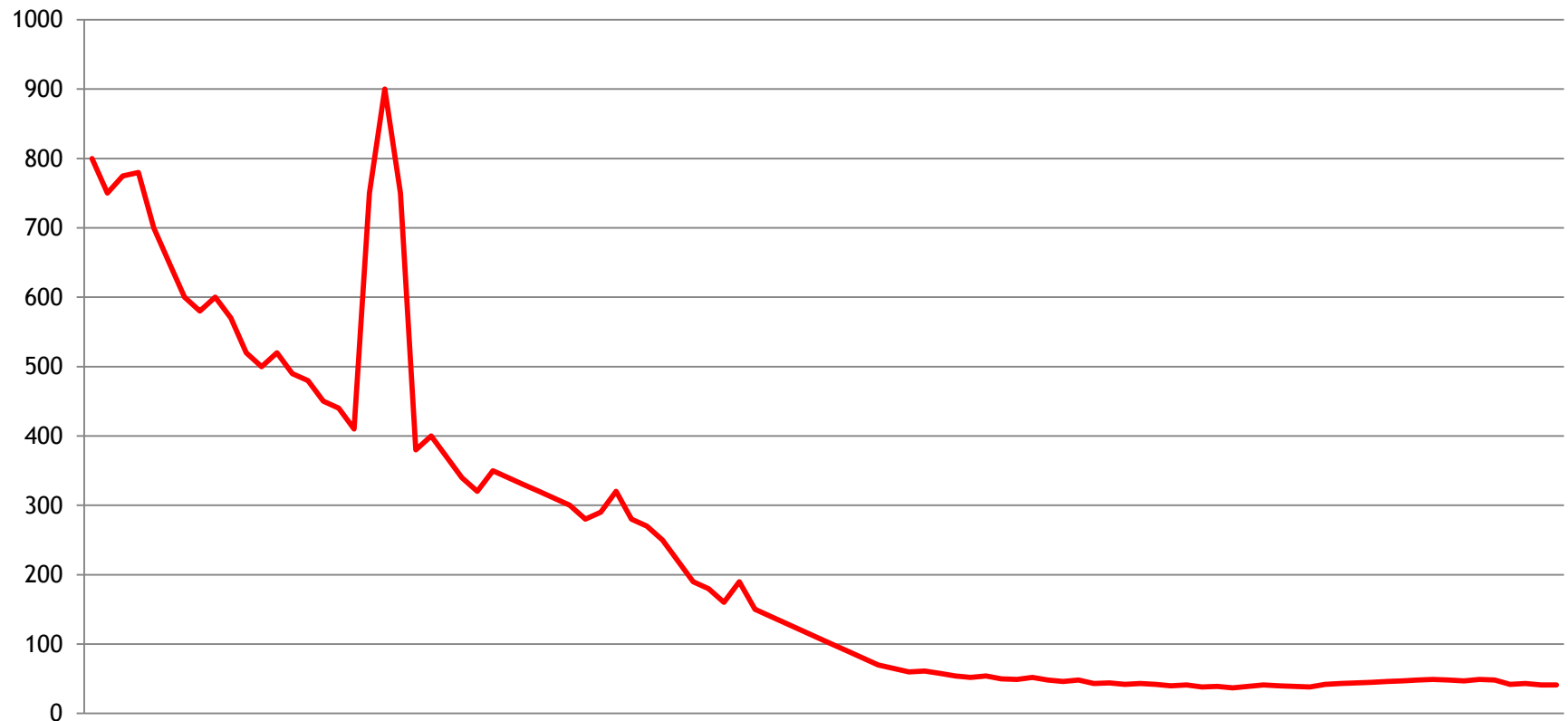# Public Health Performance Management Centers for Excellence

Learning Objectives

- Understand basic method for Quality Improvement Projects

- Understand purpose and value of common QI tools, including Pareto diagrams, histograms and flow charts

- Simulate the group process and analytical approach of a QI project

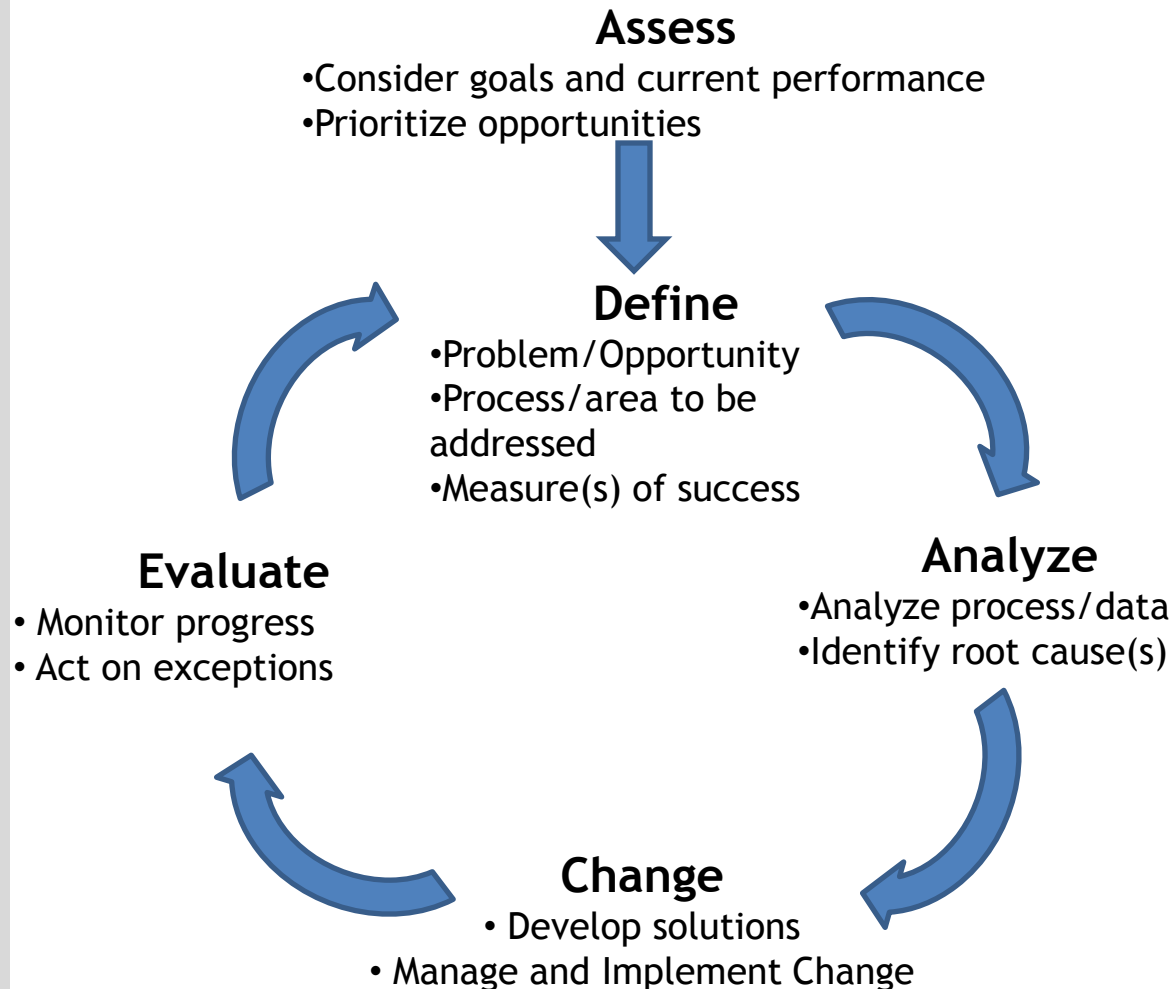# Public Health Performance Management Centers for Excellence

Deaths from Infectious Disease/100,000/year
1900-1995

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Public Health Continuous Improvement

Assess
•Consider goals and current performance
•Prioritize opportunities

Define
•Problem/Opportunity
•Process/area to be addressed
•Measure(s) of success

Analyze
•Analyze process/data
•Identify root cause(s)

Change
• Develop solutions
• Manage and Implement Change

Evaluate
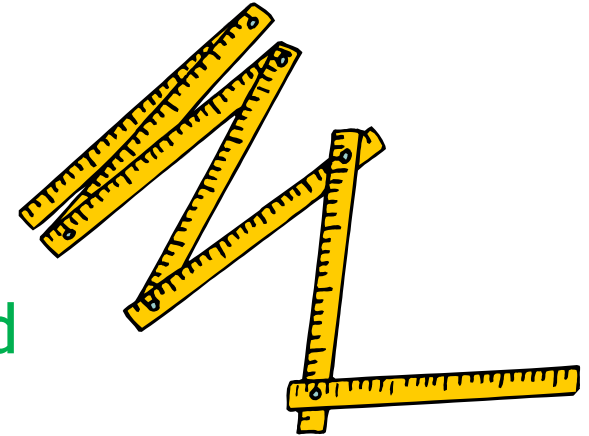• Monitor progress
• Act on exceptions

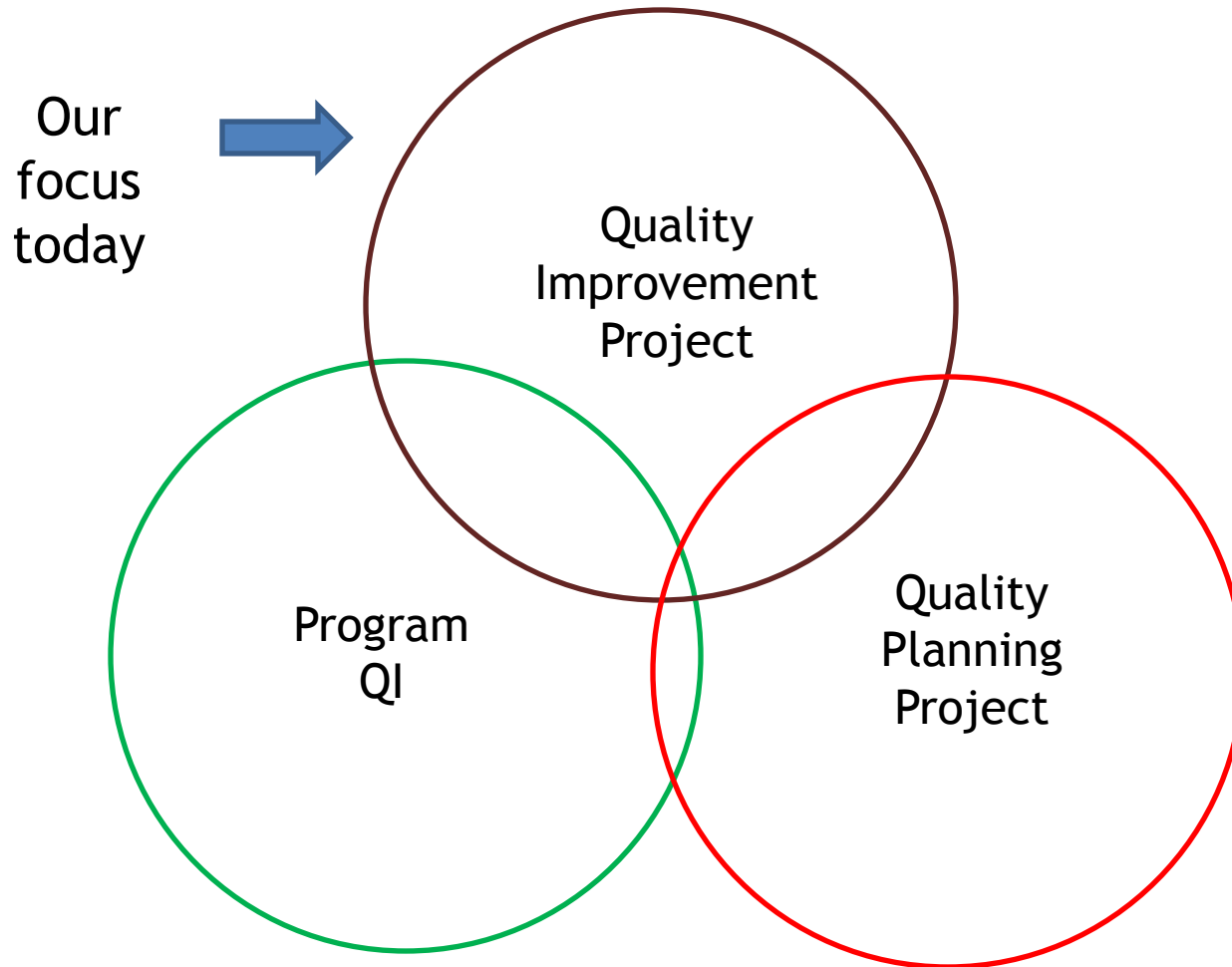# Public Health Performance Management Centers for Excellence

Change Management Principles

All quality methods/approaches are based on...

- Meeting customer requirements
- Understanding variation
- Standardizing process
- Using continuous scientific method

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Same Basic Method – Different Applications

Our focus today →

Quality Improvement Project

Program QI

Quality Planning Project

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Quality Improvement Project Steps

Assess (Triage)
1. Assess organizational goals and current performance
2. Determine most important problems/biggest opportunities

Define
3. Define problem/opportunity
4. Define process(es)/service to be addressed
5. Define measure(s) of success
6. Define stakeholders, customers and team

Analyze (Diagnose)
7. Analyze process(es) and data
8. Determine potential causes
9. Determine "root" causes

Change (Treat)
10. Consider solution options
11. Determine "best" solution(s)
12. Test Solutions
13. Manage Change
    Social
    Technical
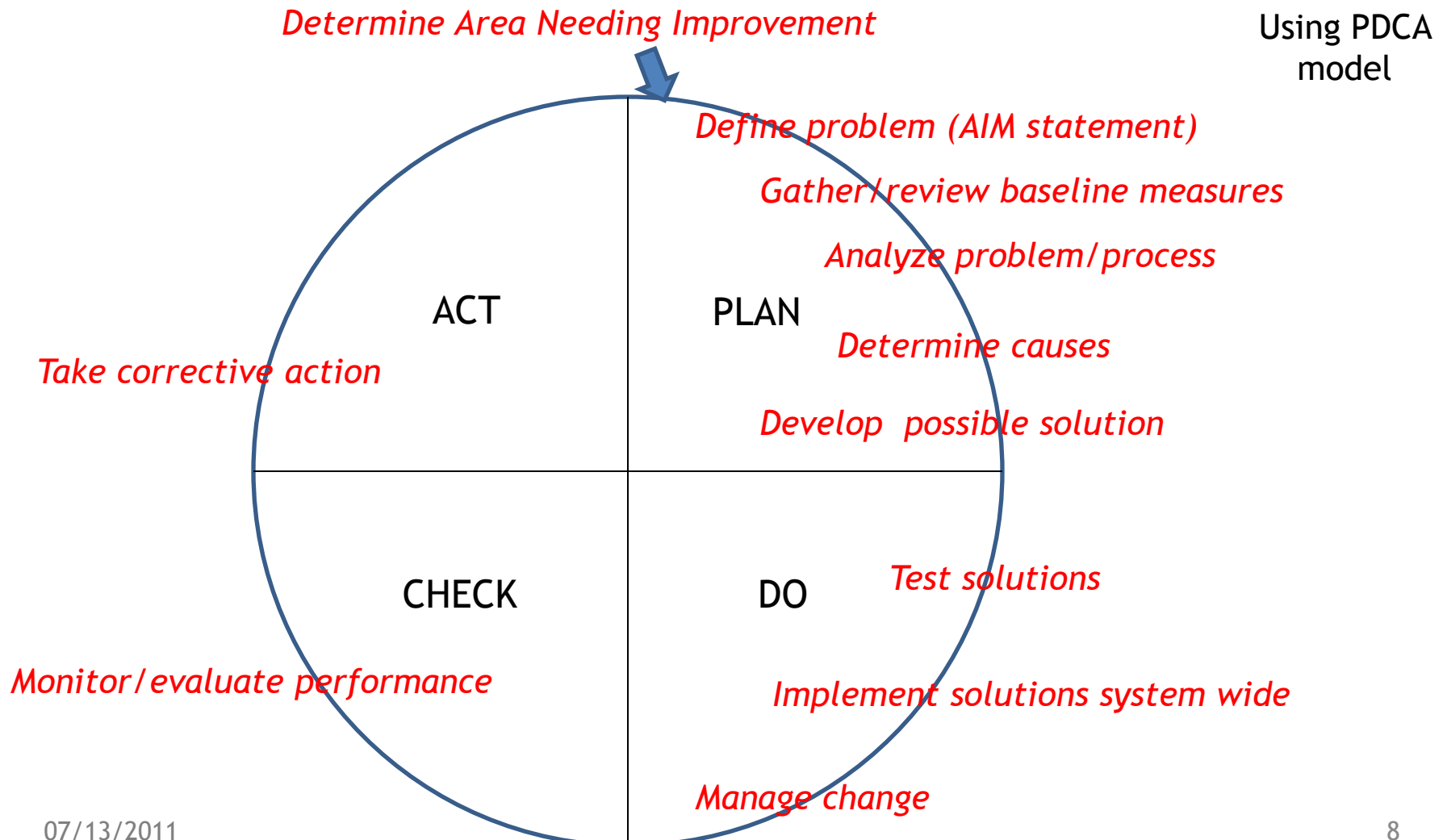14. "Hand-off" to operations – including Evaluation plan

Evaluate (Follow-up)
15. Monitor performance against measures
16. Maintain solution(s) (if working)
17. Re-enter Improvement Cycle

Based on adaptation of Public Health model

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Quality Improvement Project Steps

Determine Area Needing Improvement

Using PDCA model

Define problem (AIM statement)

Gather/review baseline measures

Analyze problem/process

PLAN

ACT

Determine causes

Take corrective action

Develop possible solution

CHECK

DO

Test solutions

Monitor/evaluate performance

Implement solutions system wide

Manage change

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The QI-QP "Hybrid" Project

- Projects can start with a QI approach and not find narrow "root" causes

- Large portions or even all of the process may need to be re-designed

- Even standard QI projects can sometimes benefit by borrowing from the QP toolbox

Assess

For Project QI & QP

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Assess

- Management Role – cannot be delegated
- May be done by
  - Mgmt Team
  - Quality Council
  - Strategic Planning Group

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Assess

- Based on assessment of:
  - Strategic priorities
  - Community Health Assessment
  - Quality Improvement Plan
  - PH Standards review
  - Results of internal measurement system
  - Staff suggestions
  - Some combination of all of these

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Assess Tools

- Prioritization Matrices

- Logic Models

- Log Frames

- System Modeling

- Or *...any means whereby Management considers the landscape of what could be done and <u>focuses on the most important</u>*
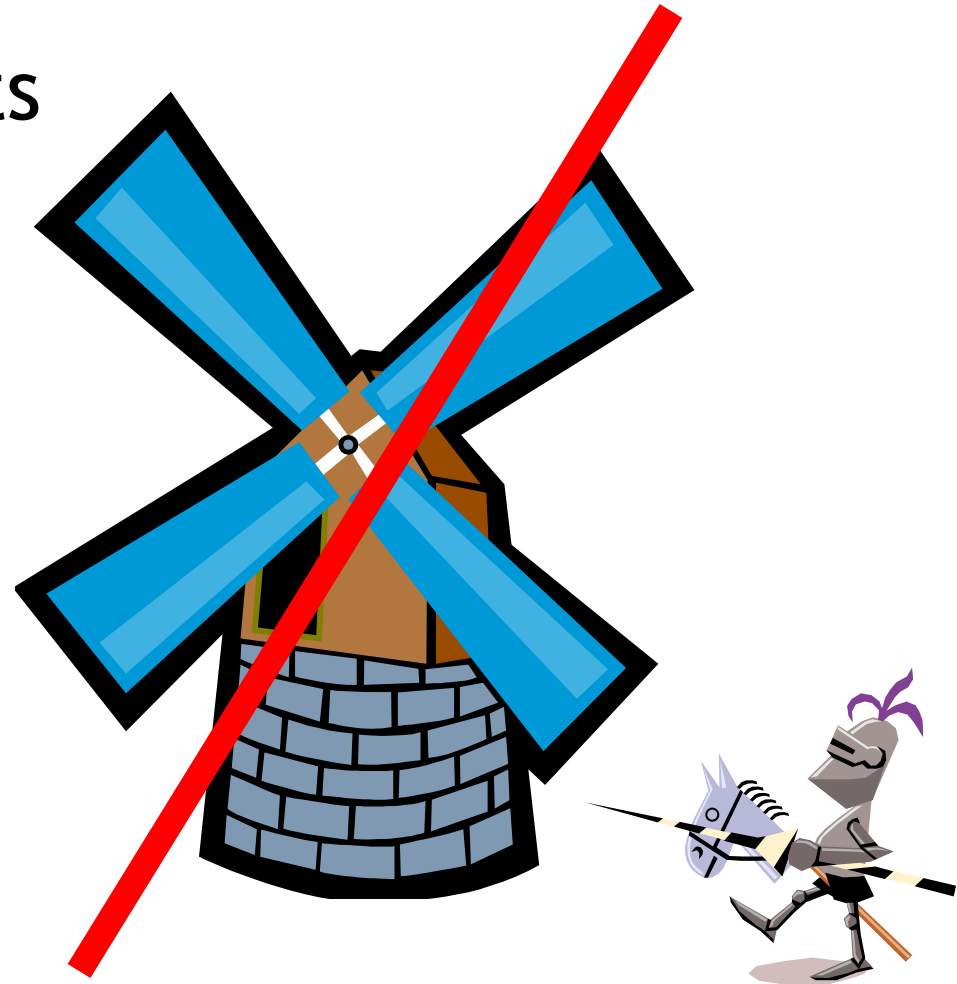
Assess

- **_Ideal_** Candidates for QI projects
  - Measureable
    - Not necessarily what you currently measure, but what you could/should
  - Repeatable
    - Not something you are just going to do once
    - The more repetitious the process, the more applicable the QI tools
  - Sustainable
    - On-going process management will be maintained after the project
  - Important
    - QI involves a significant use of resources. Don't spend those resources on something just to "do QI"
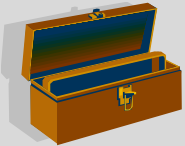
Assess

- Ideal ***FIRST*** projects
  - Feasible
  - Easily measured
  - Highly repeatable
  - Sensitive

Tool Box!

Discussion

What are some possible projects within your agency which might match these QI criteria?

Assess

Set project teams up for success …

- Develop clear problem and mission statements (draft)

- Determine sponsor and team leader

- Resource team
  - Training
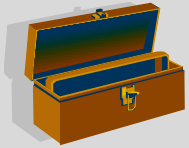 - Time
  - Attention

Define

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Define

1. Define problem/opportunity
2. Define process(es)/service
3. Define measure(s) of success
4. Define Customers, Stakeholders and Team

Tool Box!

Define

Tool: Project Definition Document

A.K.A. ... Team Charter, AIM Statement, Scope of Work, etc.

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Define

Project Definition Document

- Sponsor and Team Leader draft together
- Team Leader and Team validate and edit
- Sponsor endorses final

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Problem / Opportunity Statement

Explains <u>what</u> the problem/opportunity is and <u>why</u> it is important

- Specific
- Clear
- Measurable
- 2-3 sentences
- Does not assume cause or solution (usually)

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Problem/Opportunity Statement ~ A formula for QI Problem Statements

- Part one: Describe current operational performance

- Part two: Indicate the impact of that performance

"Currently ... (quantitative indicator of operational performance).

"Resulting in ... (the outcomes such performance has on health, revenue, satisfaction, etc.)."

Problem/Opportunity Statement

Related to an existing process with opportunity for improvement

Current information indicates that the cycle time of inspections averages five business days, though some can take up to 3 weeks to complete. These outliers result in customer complaints and increased call volume.

Probably QI

Problem/Opportunity Statement

Related to an existing but poor performing process

Current data demonstrate that first maternal home visits meet the 7 day referral standard 65% of the time. Benchmark information indicates that other LHJs meet or exceed the 7 day standard 95% of the time.

Late response may limit our effectiveness on health outcomes for mother and child.

Probably QI

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Problem/Opportunity Statement

Related to potential new service

Changes to state law regarding Tattoo Parlors indicate that the Department will have new health inspection responsibilities starting next year. With an estimated 90 establishments in the County, this represents both a substantial potential cost but also a revenue opportunity for the Agency.

Probably QP

Problem/Opportunity Statement
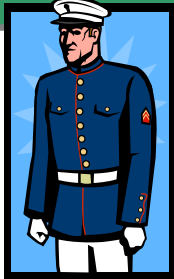
Don't do this

We are getting too many customer calls and complaints due to lost packages, late deliveries, and mistake orders. We need to implement bar coding technology so that things run more smoothly.

Probably a mess

Mission Statement

Clearly states what you are going to do regarding your primary measure of success...

USMC: "Take *Hill 405* by noon tomorrow"

Direction + **Indicator (#)** + **Target** + **Timeframe**

Start here …

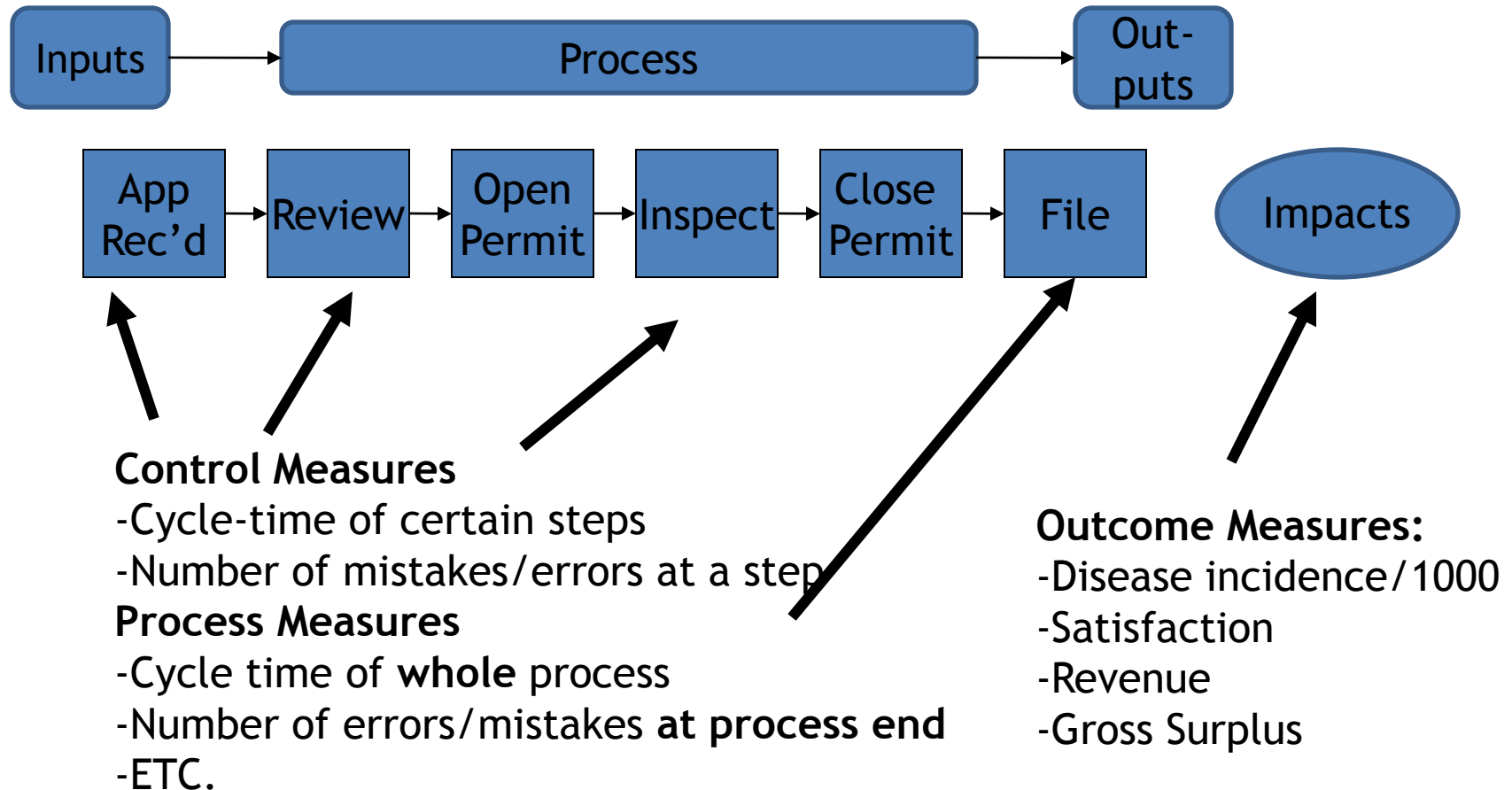**A.K.A., Aim statement, purpose statement, goal statement, etc.*

Quality Indicators

A specific <u>quantitative indicator</u> of performance – a *number*

- How long something takes (#days, #hours)
- How often something is damaged, incomplete, broken, in error, late (% of total, a count)
- How often people get sick (# incidences)
- How satisfied a customer is with a specific aspect of performance (% sat' with *X*)
- How much a specific action costs ($ per *X*)

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Types of Indicators

Inputs	→	Process	→	Out-puts

| App Rec'd | → | Review | → | Open Permit | → | Inspect | → | Close Permit | → | File | | Impacts |

Control Measures
-Cycle-time of certain steps
-Number of mistakes/errors at a step
Process Measures
-Cycle time of **whole** process
-Number of errors/mistakes **at process end**
-ETC.

Outcome Measures:
-Disease incidence/1000
-Satisfaction
-Revenue
-Gross Surplus

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The perfect indicator is...

- Sensitive
- Consistent
- Accurate

But Sensitive and Consistent are most important!

Perfect accuracy is not necessary for quality improvement!

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Quality Improvement Indicators

- Specific and operational *process indicators* are required at this stage of Quality Improvement.
- Otherwise, team will not know how to approach it's analysis of the problem
- Typically …
  - Cycle time … how long something takes
  - "Defect" … how often there are errors, omissions, incidences
  - Productivity … number of transactions per x

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- Outcome indicators … (may be near term/long term)
  - Satisfaction
  - Revenue
  - Community Health outcomes
- It is important to link these outcomes to the team's activities, BUT …
- A QI team typically works on and fixes *process indicators*

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Quality Planning Indicators

- QP indicators will be broader at this stage of project
- Typically … there will be outcome indicators vv. Health outcomes, Revenue, cost, and satisfaction
- May also have (depending on what is known about customer needs) "cycle time" or "defect" or other process indicators
- Process (& control) Indicators will be determined in Change Phase

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Target: "Decrease late inspections to 2% or less"

- A goal or expectation for a specific indicator.
- May be based on a known customer standard
- May be an arbitrary %/# increase/decrease
- Not absolutely necessary to move forward
- May not be able to identify a target until team analyzes process and understands current performance
- Targets apply to a given improvement cycle; Does not mean that's all you will ever achieve

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What if there's no indicator in place?

Very common in services …

- Consider putting on-going measure in place as team begins (best, but not always possible/practical)
- Consider a "pre" sample (not ideal but better than nothing)
- Sometimes you need to do analysis even to know HOW you would put measures in place
- You may have to wait until Change phase to put measures in place (not ideal)

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Mission Statement (Bringing it all together)

Direction + Indicator (#) + Target + Time frame

Remember "S.M.A.R.T." goals are:
- Sensitive
- Measurable
- Achievable
- Relevant
- Time-limited

A.K.A., Aim statement, purpose statement, goal statement, etc.

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Mission Statement

Explains what your purpose and goals are

- Typically, an imperative statement regarding your *primary* indicator
- Should not assume specific cause or solution (usually)
- Should be specific and measurable
- *May* contain a target
- *May* contain a timeline
- 1-2 sentences

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Suited to QI ...

- Reduce # of late deliveries from 12.5% of total to 2% (or less) of total [by e.o.y.]
- Reduce # of hours from request to order entry to within 24 hours [by start of 3rd quarter]

Suited to QP...

- Establish new inspection service for Tattoo Parlors that is compliant with state law, is revenue positive, and is satisfactory to parlor owners [prior to RCW implementation date]

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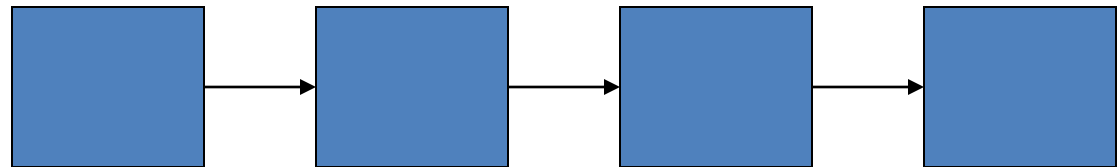
Process Boundaries

- The "start" and "stop" of the process you will be working on

- Helps determine scope of project

- Helps determine stakeholders, customers and team

- Helps determine appropriate measures

- Process boundaries will be more abstract for a QP project than a QI project
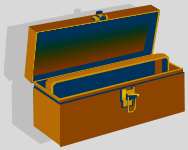
Tool Box!

High Level Flow Chart

- Documents start and end of process
- Documents primary objectives/steps of process
- 4-7 steps (typically)
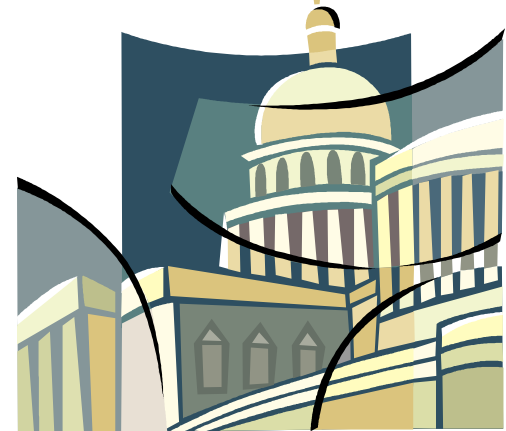- More conceptual

Exercise

- Nirvana County … part 1

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Who is the customer?

- Not always easy to define in service industry

- Especially hard in government services

Who is the Customer?

- Direct/Primary Customers:
  - Who receives the *end product* of the process?
  - Who *experiences* the process?
  - Who is *paying* us?
- Usually, design to or fix to the needs of: The DIRECT customer
- More than 2 direct customers may indicate a lack of focus

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Who is the Customer?

- Indirect/Secondary customers:
  - Regulatory/Political entities that govern our responsibilities and place constraints on what we do (laws, ordinances, regulations, etc.)
  - Senior Management that govern our responsibilities and place constraints on what we do (policies, etc.)
  - Suppliers/employees that are part of the existing process and need support to do their job

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Are we sure we know what they need?

What they say

"I need good service!"

What we assume
"They want it fast"
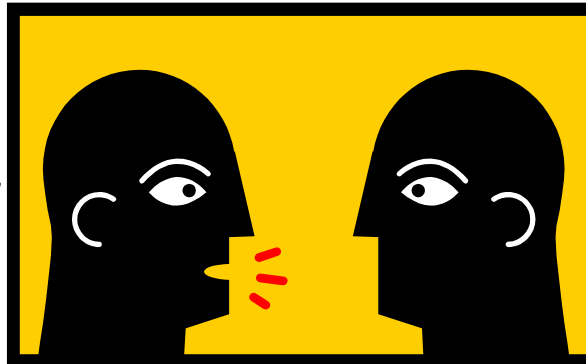
What they mean

- "Listen to me and remember
- Use words I understand
- Let me know what to expect
- Don't make me do something twice
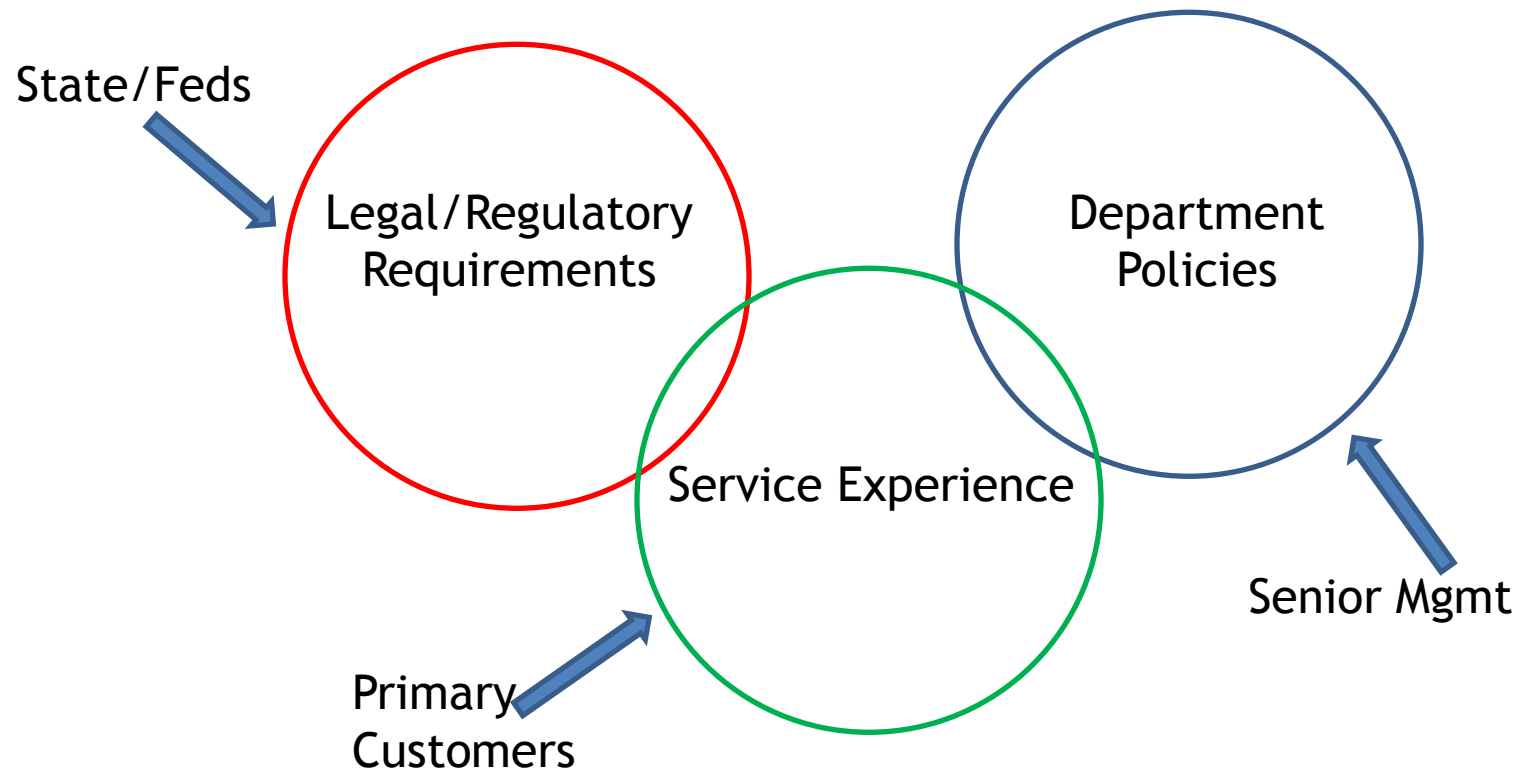- If something does go wrong, explain it to me and fix it When you say you will"

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- Marni Mason "Who Makes the Call?":

State/Feds

Legal/Regulatory Requirements

Department Policies

Service Experience

Senior Mgmt

Primary Customers

Team Membership

- QI project team membership based largely on (high level) steps of existing process

- QP project team membership may include some representatives of existing process but not necessarily all. May also include:
  - "Fresh Perspective" – someone outside of existing process known for creative ideas
  - Potential suppliers
  - Customers

Team Selection Criteria

- Balance team/input "horizontally" (across process) and "vertically" (mgrs & staff)
  - Anticipate resistance – seek input from all stakeholders*
  - Remember: "People support what they help to build …"
  - 5-7 is ideal team size

*Not all stakeholders need to be team members – but you need to find a way to get their input and keep them updated

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Key Role: Project Sponsor

- Person primarily responsible for resourcing and governing the project

- Usually has a large stake in the success of the project AND the on-going success of the process

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Key Role: Team Leader

- Responsible for success of the project
- May have stake in on-going success of the process

Characteristics …

- Able to suspend bias
- Comfortable with analytical methods
- Comfortable with groups
- Effective leader

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Key Role: Process Owner

- Person (or management group) with largest stake in the successful on-going performance of the process
- May correspond with team leader or team sponsor
- "Sustaining the Gains" requires that the organization define accountability for process performance
- May not be able to define until the process/service is better understood by the team

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Key Role: Team Facilitator

- Responsible for providing knowledge re: Quality methods and tools

- Supports effective group process

Analyze

For Quality Improvement

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Analyze

7. Analyze the process(es) and data

8. Determine potential root causes
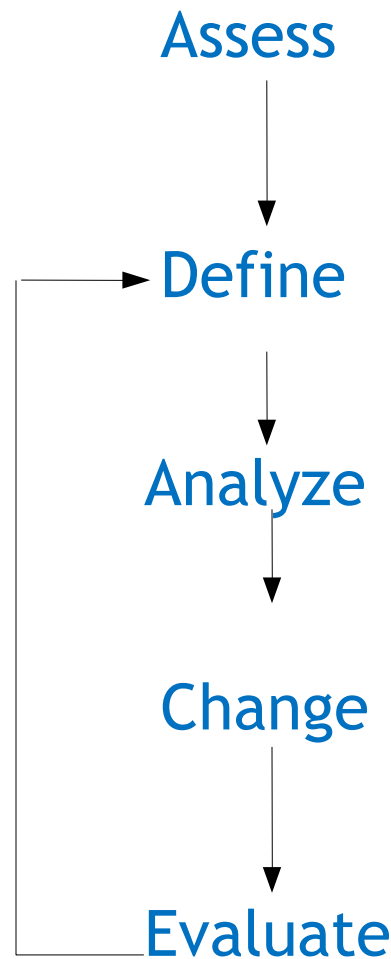
9. Determine "root" causes

(Sometimes in Analyze Phase you will discover that the process is undefined, wildly variable, and incapable of meeting customer needs. When this is the case you may "jump" to the Change Phase and borrow from the QP tool box.)
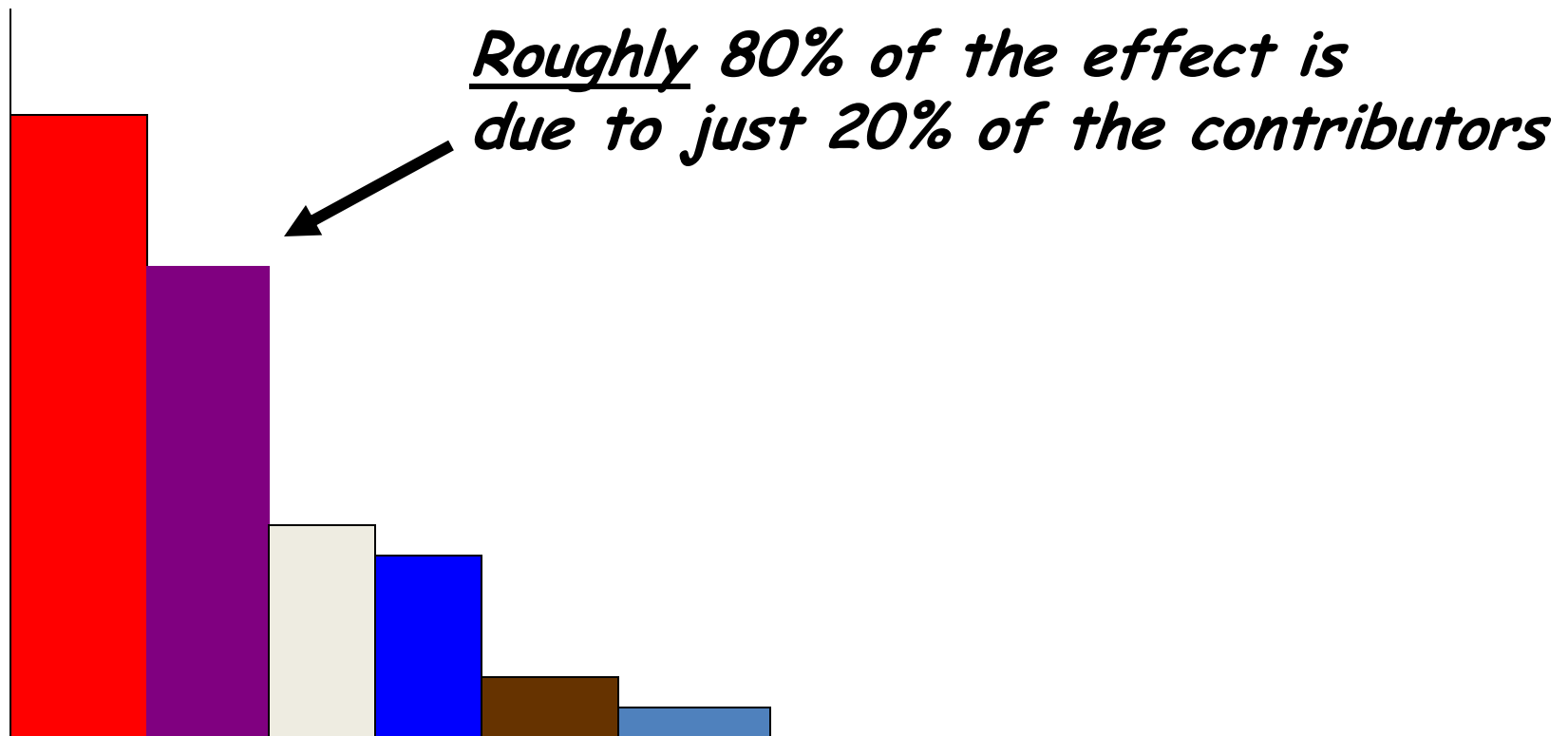
Analyze

- From the Greek root: "to break-down"

- Problems rarely have just one cause

- But, they usually do have 1-3 causes which cause *most of the problem*

- These are the "root" causes

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The Improvement Funnels

Assess

Define

Analyze

Change

Evaluate

Many Problems

Most important problems

Many Possible Causes

Root Cause(s)

Many Alternative Solution(s)

Best Solution(s)

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Pareto Principle (80-20 Rule)

Roughly 80% of the effect is due to just 20% of the contributors

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Pareto Principle (examples)

- 1% of people control 90% of the wealth in the U.S.

- The first two years and last two years of life consume 85% of our health care expenditures

- 15% of cars on the road cause 50% of the auto-related pollution

- 10% of U.S. consumers purchase 43% of all beer

- What % of your "friends" contribute most of the Facebook posts?

Analyze for QI

The *key* to effective analysis is coming up with <u>clear questions</u>!
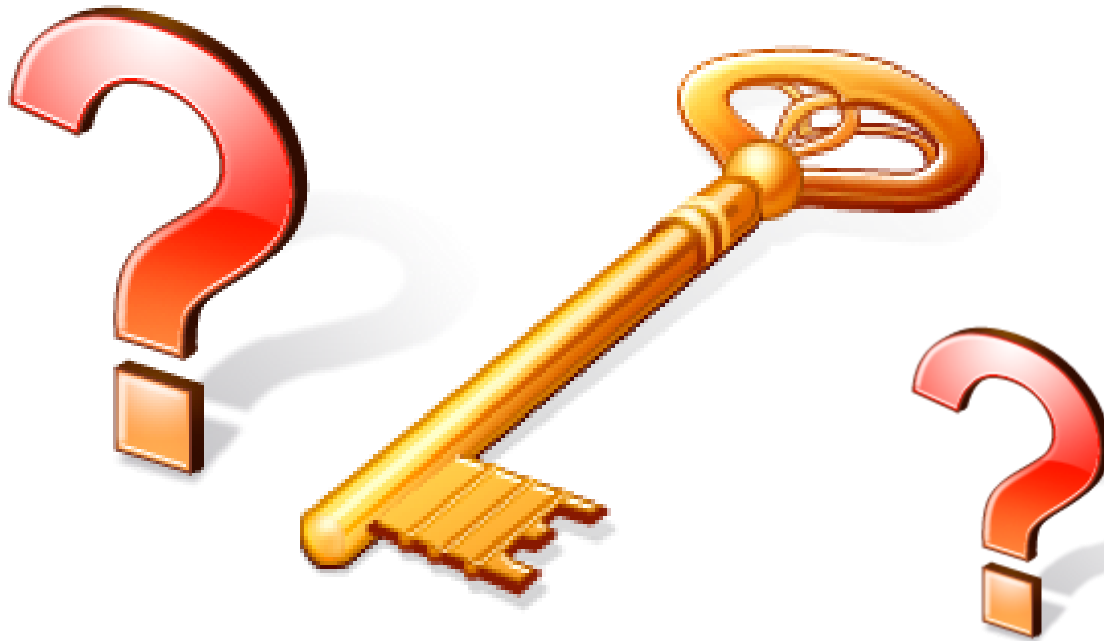
General questions lead to more specific questions ...
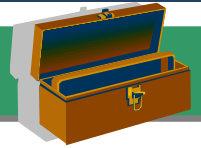
What did John Snow ask?

London Cholera Epidemic 1854

- Who is dying of cholera?

- Where do they live?

- What did they eat, drink, do prior to getting sick?

- What do they have in common?

- Why the Broadstreet pump?

Analysis Tool (concept): Stratification

Tool Box!

aka … "Cutting" the data …

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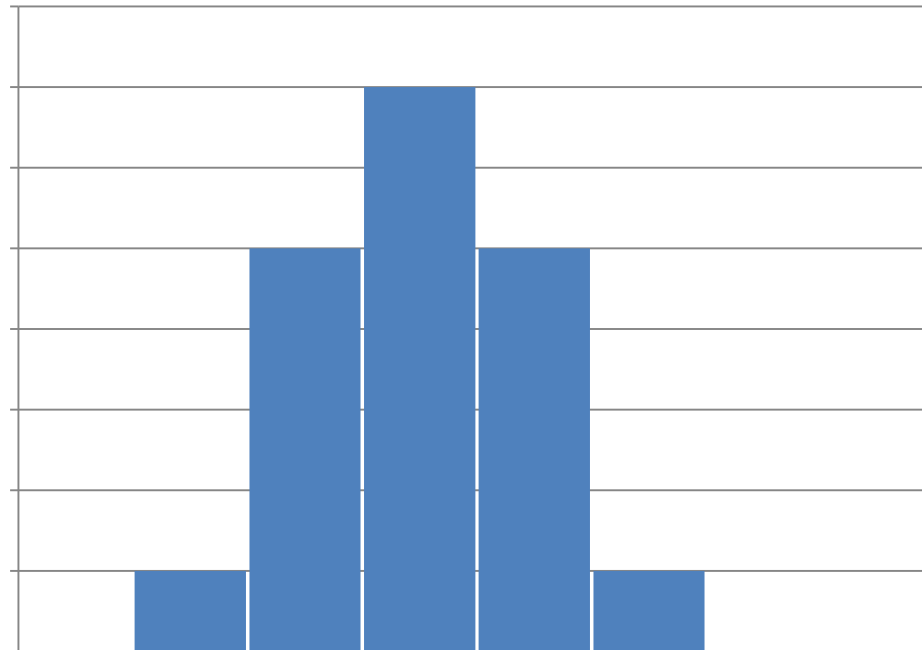## Analysis of "Cycle-Time": Typical Questions & Tools

- What are the boundaries and steps of the process (flow chart)
- What is total time?
- Are there patterns in total time (seen in histogram/box plot) that would indicate an association? If so, focus there.
- What are major steps/intervals of process and how long do those take? Which ones take most of the time? Focus there.
- Within intervals are there patterns (seen in histogram/plot) which would indicate an association? Focus there.
- Within intervals or between steps are there rework loops (seen in flow charting)? Focus there.
- Once you are focused, develop specific theories (use CED)
- Test/investigate your best theories.

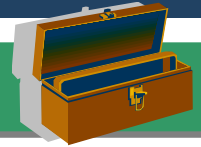## Histograms aka...Frequency Distributions

Tool Box!

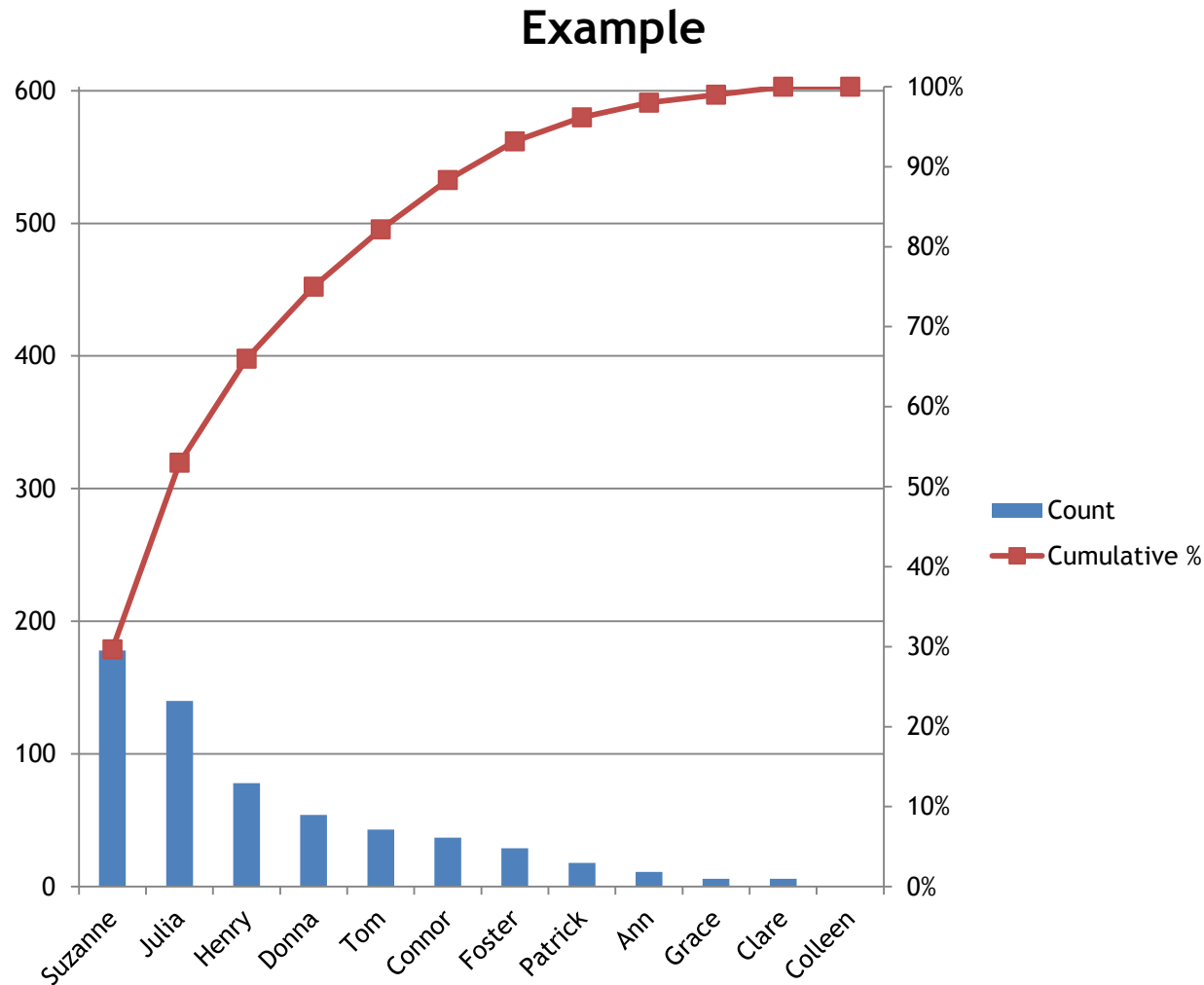## Analysis of "Defects": Typical Questions & Tools

- How many defects are there (absolute and % of total)?
- Do some kinds of defects happen more often than others (determined through Pareto diagram)? Focus there.
- Do those defects happen more often when associated with a particular variable (time of day, day of week, shipment type, vendor, customer type, employee, etc.)? (Pareto chart or similar). Focus there.
- You may repeat this "what happens most?" focusing operation multiple times.
- Once you are focused, develop specific theories (use CED)
- Test/investigate your best theories.

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Pareto Diagram example

Example

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Data Collection Planning Matrix

Tool Box!

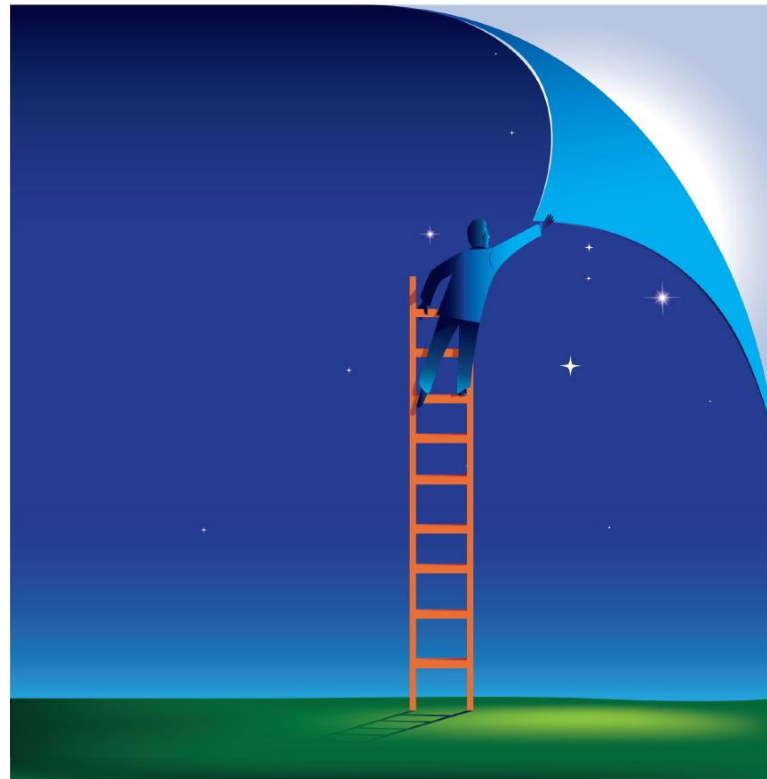| Question to be answered	Possible source Of information	Method/tool for Gathering info	Sample size Required	How info will be displayed

How much data?

- Avoid drawing inferences from small numbers
- But … QI rarely requires levels of confidence associated with academic science
- Balance time/volume to collect against the costs and risks involved
- Generally … *minimal* size of 35
  - More if it's easy to get
  - More if you anticipate "cutting" the data a lot

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Exercise

- Nirvana County ... part 2

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How Rigorous Do We Really Need to Be?

- Scope: *How many pieces of the organization are involved?*

- Depth: *How many people are affected?*

- Complexity: *How interdependent/dynamic are the variables?*

- Risk: *Customer impact? Cost implications? Public impact?*

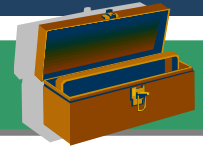The more "S-D-C or R" the more rigor required

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Implications of high SDC or R...

- Data over experience
- Higher sample sizes
  - Always avoid inferences from less than 30-50 cases
- Larger confidence intervals
- More thorough testing cause theories
- More thorough testing of solutions prior to implementation

ALWAYS! ... put evaluation in place

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Analysis Tool: Detailed Process Flow Chart

Tool Box!

Complete Task

Is it correct?

no → Review w/ Mgr

yes

Pass form to Accounting

Input into System
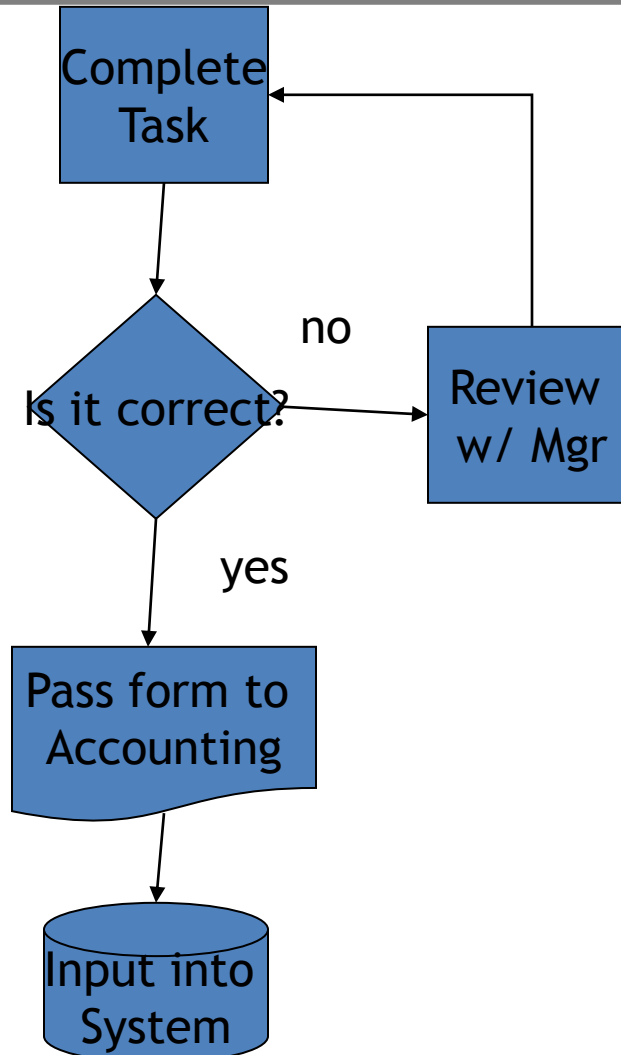
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Analysis Tool: Things to look for
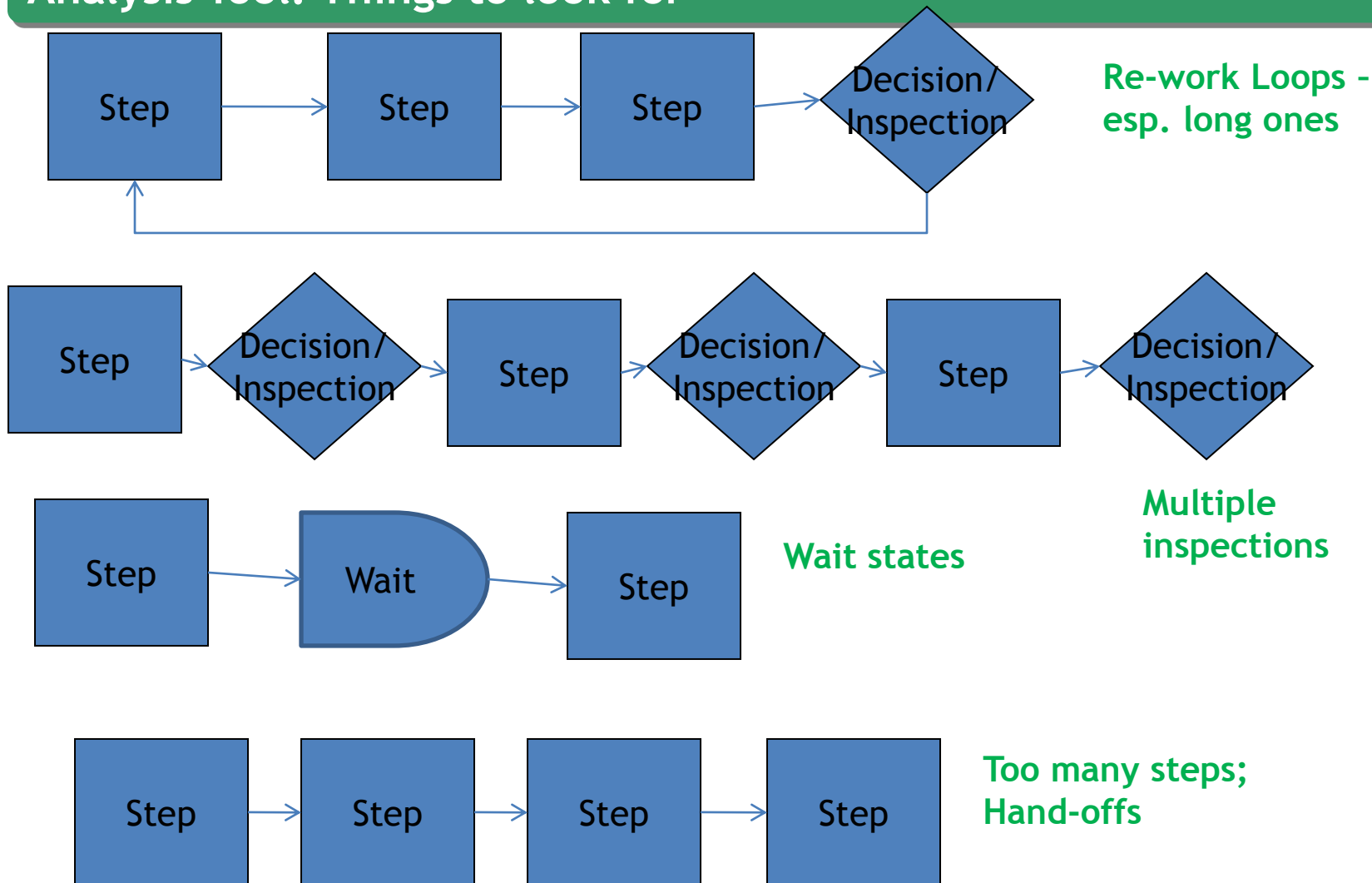
Step → Step → Step → Decision/Inspection

Re-work Loops – esp. long ones

Step → Decision/Inspection → Step → Decision/Inspection → Step → Decision/Inspection

Multiple inspections

Step → Wait → Step

Wait states

Step → Step → Step → Step

Too many steps; Hand-offs

Exercise

- Nirvana County ... part 4

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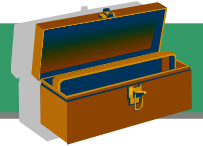## Analyze: Are we there yet?

- Analyze is (usually) the hardest phase of QI

- It's easy to feel lost

- Doesn't always feel like you're making progress

- Can be hard to know when to stop

Analysis Tool: Cause & Effect Diagram

Tool Box!

Effect Statement
(as specific and measurable
as possible)

Theory of cause

Specific theory
of cause
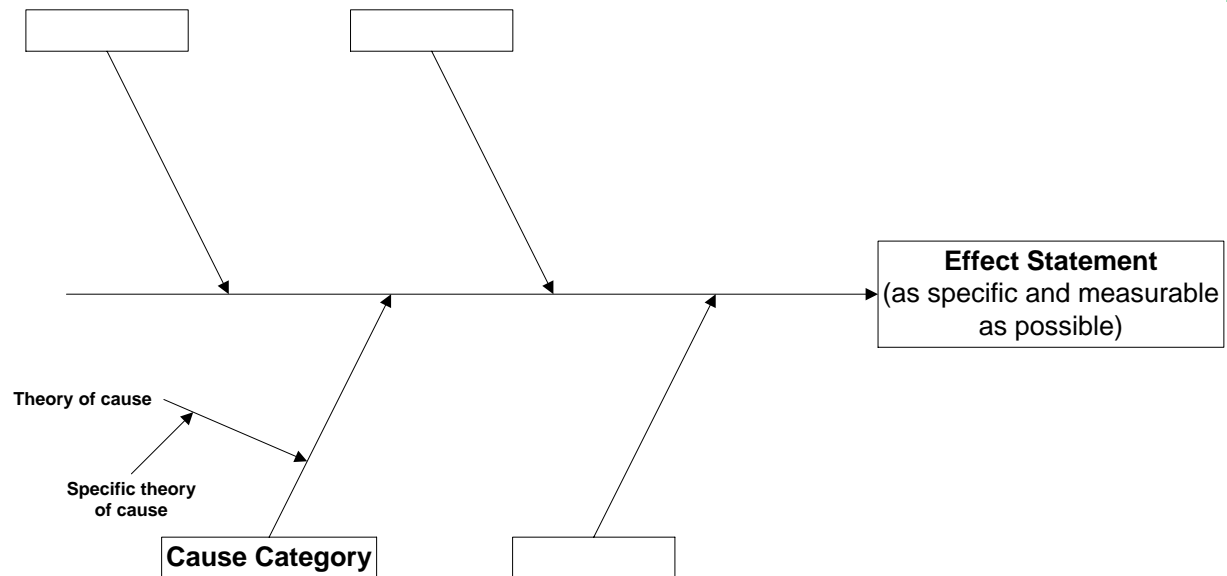
Cause Category

"Fishbone" Format
(Aishikawa)

Analysis Tool: Cause & Effect Diagram

Typical Cause Categories

People

Machines

Process

Customer

Environment

Vendors

OR: Brainstorm causes on Post-It Notes and then group in natural affinities (see affinity diagram)

Exercise

- Nirvana County ... part 5

Analyze: Are we there yet?

- Have you moved from asking what, where, when to _answering_ "why?"

- Have you narrowed enough that you have a good sense of what _specific_ thing(s) you are going to fix?

- Are you confident* you will have an impact on your mission if you fix the "root causes" you've found?

✱Not 100% confident, but confident enough to move forward given the scope, depth, complexity or risk of what you are working on ...

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Yes!

Then you are ready for the CHANGE phase!

"We're finally there!"

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Analysis Tools: Summary

- **Flow Chart**: Helps document current process flow and I.D. potential gaps, flaws, delays, uncertainties
- **Cause & Effect Diagram**: Helps conceptualize and sort possible contributors/causes
- **Pareto Diagram**: Data tool used to determine major contributors to a "defect" problem (pie charts can work, too)
- **Histogram:** Data tool useful for identifying variation in "cycle time" or other continuous variables (rates, volume, etc.)
- **Line/trend chart**: Data tool useful in identifying patterns of variation over time (also your key Evaluation/Control data tool)
- **Scatter Plot**: Data tool useful for finding associations between two continuous variables
- **Box & Whisker Plot**: Data tool useful for identifying variation for continuous variables, especially when sample size is small and/or you want to compare multiple samples side by side

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QI Analysis Tools

✓ A Lot
✓ A little

When will I use them?

	Assess	Define	Analyze (early)	Analyze (late)	Change	Evaluate
Flow Charting		A little	A Lot	A Lot	A Lot	A little
Stratification	A little		A Lot	A little		A little
Pareto Diagrams	A little		A little	A little		A little
Histograms	A little		A little	A little		A little
Box Plots			A little	A little		A little
Scatter Plots				A little		
Trend Charts	A Lot		A little	A Lot		A Lot
C.E.D.s			A little	A Lot		A little

Change

For Quality Improvement

Change

11. Consider solution options
12. Determine "best" solution(s)
13. Test Solutions
14. Manage Change
    – Social
    – Technical
15. "Hand-off" to operations – including Evaluation plan

Change: Quality Design Principles for QI

- Fix only what is broken*

- Keep it Simple Silly

  – Fewer parts means less to break

- Control rather than inspect *if you can*

- Locate inspection as close to source of "defect" as possible, *if you can't*

- Keep flow smooth – avoid batches, piles, wait states

Exception: Easy, quick improvements not directly related to your problem may sometimes be added on to your "fix" agenda if they do not distract time and resources from your primary objective. AKA, "nuggets on the ground"

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Nuggets on the Ground

Sometimes in the course of addressing root causes you may see simple obvious things that could also be changed. If it doesn't distract resources from your main purpose and it will do some good … Go for it!

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Change

More Quality Design Principles

- The only variation that is "ok" is customer variation

- Strive for the "one best way"

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Documented process
Training
Inspection/Supervision
Performance Aids
Audits
Reminders
Check lists
Measurement feedback
Hard controls/Failure Proofing

Harder to sustain performance

Easier to sustain performance

Consider Solution Options

- Brainstorm options to address "root" causes. BE CREATIVE!

- Multi-vote/rank order "best" options

- Design options in detail

- Test options/Prevent Failure*

- Select options to implement

*How rigorously you need to test an option depends on the monetary and social costs. If there's little risk to trying something out, and you have a measure that will tell you if it worked, go ahead!

Solutions

Typical Evaluation Criteria

- Effectiveness
  - How much of root cause is eliminated?
- Sustainability
  - How well can this solution be maintained?
- Cost
  - Less is better than more
- Time to implement
  - Less is better than more
- Likely Resistance
  - Less is better than more

Solution Testing

remember your SDCR

- Can you confirm your solution with further data collection?

- Can you "sanity test" your solution option with the users?

  - Demonstrate option to people in process and see it is understood, feasible, etc.

- Can you "pilot" your solution?

  - Implement in smaller setting for specific period and evaluate?

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Implementation – Basic: Responsibility Matrix

What	Who	When
Task Description	Name	Due date

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Implementation – Complex (Gantt Chart)

Tasks	Duration	Days/weeks ⟶
Task 1	2 d	
Task 2	14 d	
Task 3	7 d	
Task 4	5 d	
Task 5	1 d	
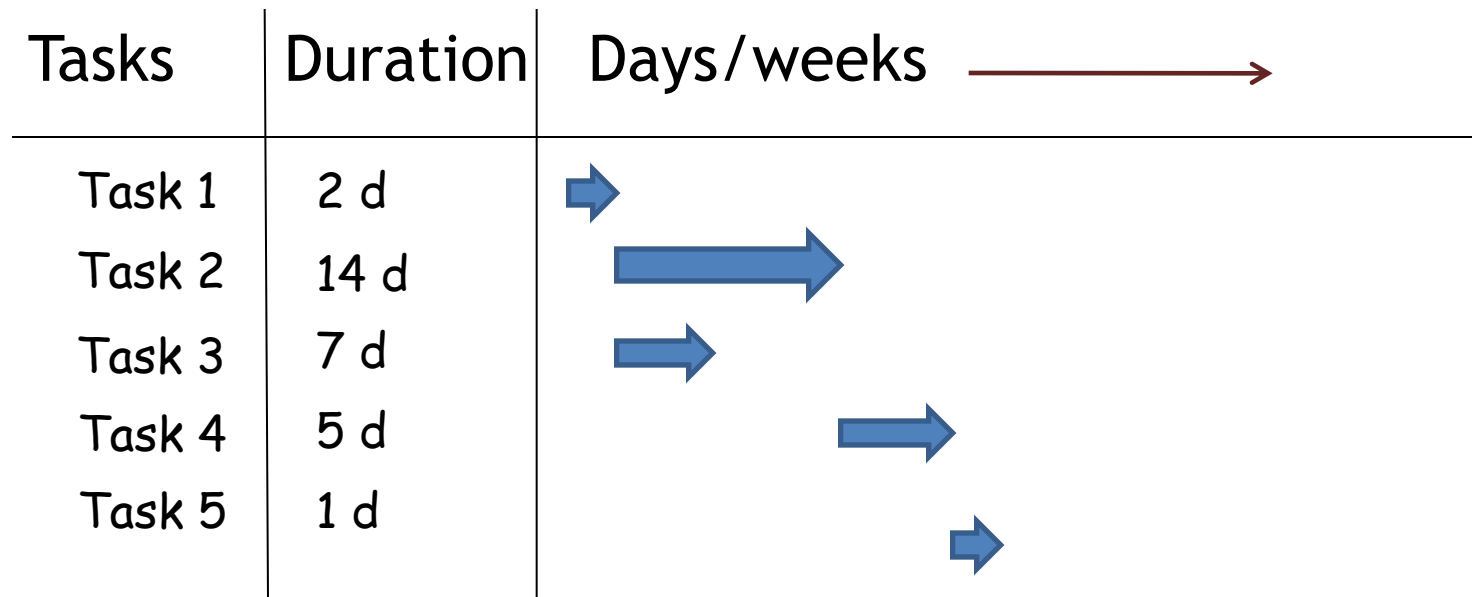
Shows …
Dependencies;
What can be done in Parallel

Change Management

- Biggest barriers to change are often social rather than technical

- *Even a positive change* will be resisted to some degree
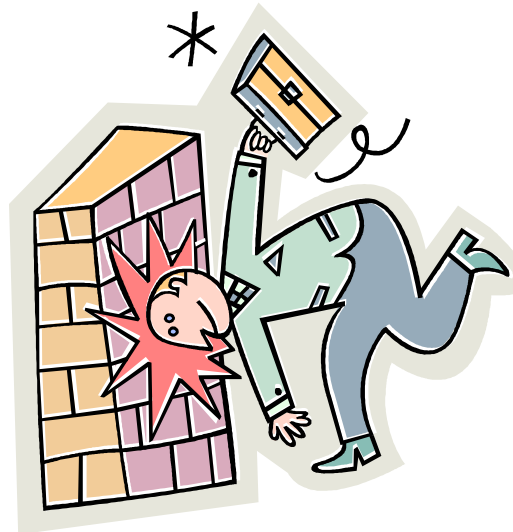
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Communication vs. Training

- Communication builds awareness and readiness

- Training develops specific skills or knowledge necessary to fulfill a step/role in the process

Communication Plan

Audience/ Stakeholder Group	Key Messages	How	Who	When

Typical QI Key Messages

- The problem and why it is important

- Who was on the team – how staff input was obtained

- Why and how the chosen solutions will address the problem

- How staff might benefit from the changes

- The efforts being made to make the change as easy as possible

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Training Plan

Employee Category	Responsibilities	Skills/ Knowledge Required	Medium	Who	When

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Evaluation Plan

Performance Indicator/ measure	Display tool	Maintained by	Responsible actor	Process Owner
# late reports	Weekly Trend Chart	Unit Supervisor	Unit supervisor	Program Mgr
# days to complete process	Box Plot Trend Chart; Monthly Histogram	Mgmt Analyst	Program Mgr	Division Mgr

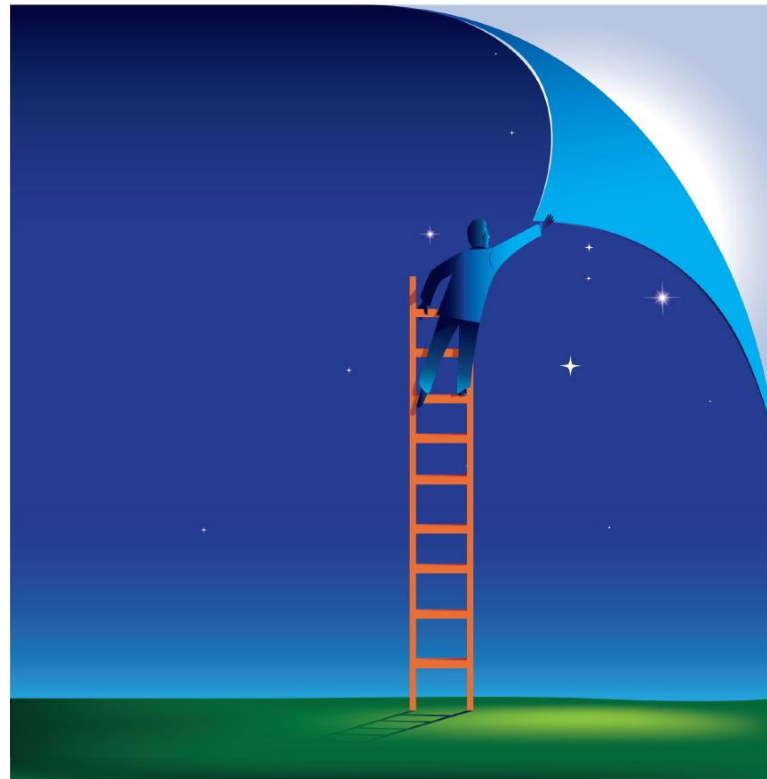# *Public Health Performance Management Centers for Excellence*

Change

Typical Hand-off "package"

- Implementation Plan/Schedule
- Process draft to be posted to intranet and/or revised process flow chart
- Other controls (software change, reminders, forms, etc.)
- Communication/Training Plan
- Evaluation (follow-up) plan
  - Audit schedule
  - Measurement feedback mechanism
  - Control charts or other visual measurement tools
  - Defined accountability to act on non-compliance/process failure

Exercise
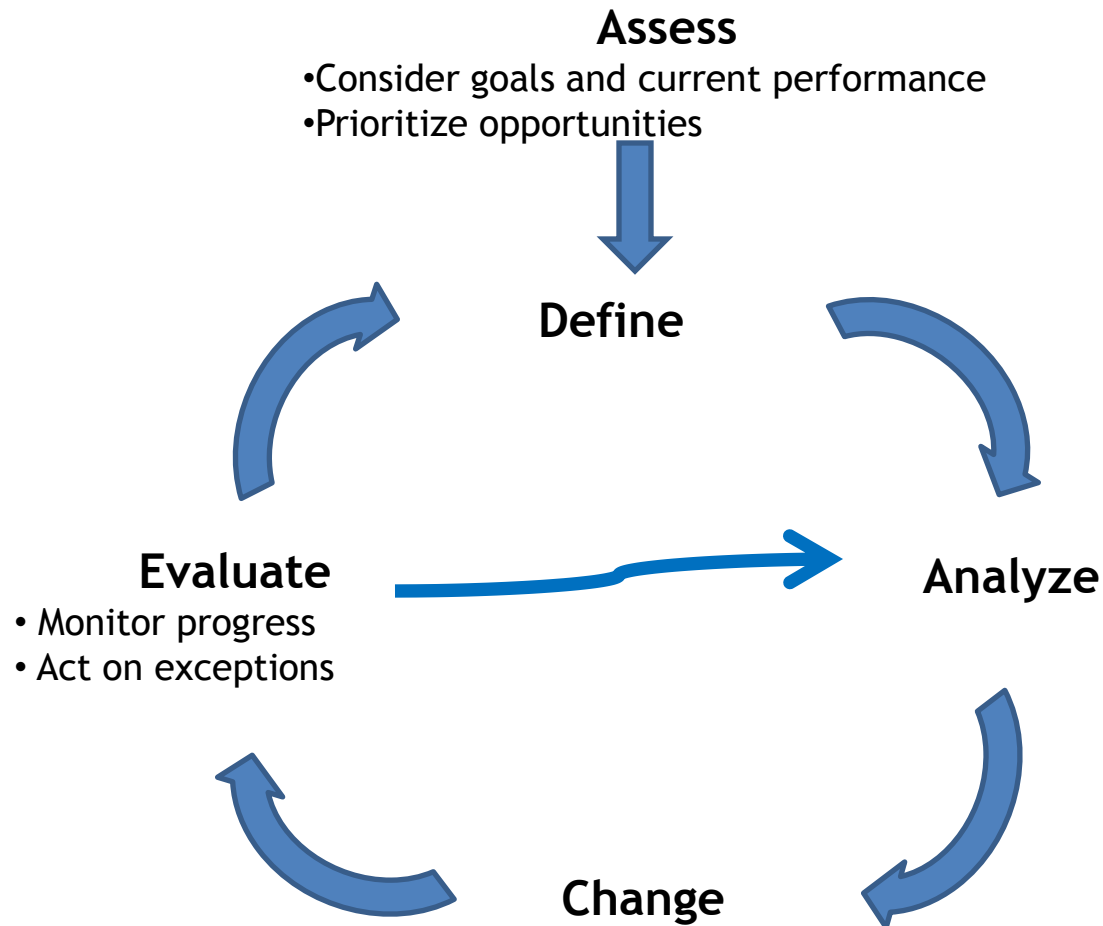
- Nirvana County … wrap up

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Evaluate

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Evaluate

16. Monitor performance against measures

17. Maintain solution (if working)

18. Re-Enter Improvement Cycle as needed

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Public Health Continuous Improvement

Assess
•Consider goals and current performance
•Prioritize opportunities

Define

Analyze

Evaluate
• Monitor progress
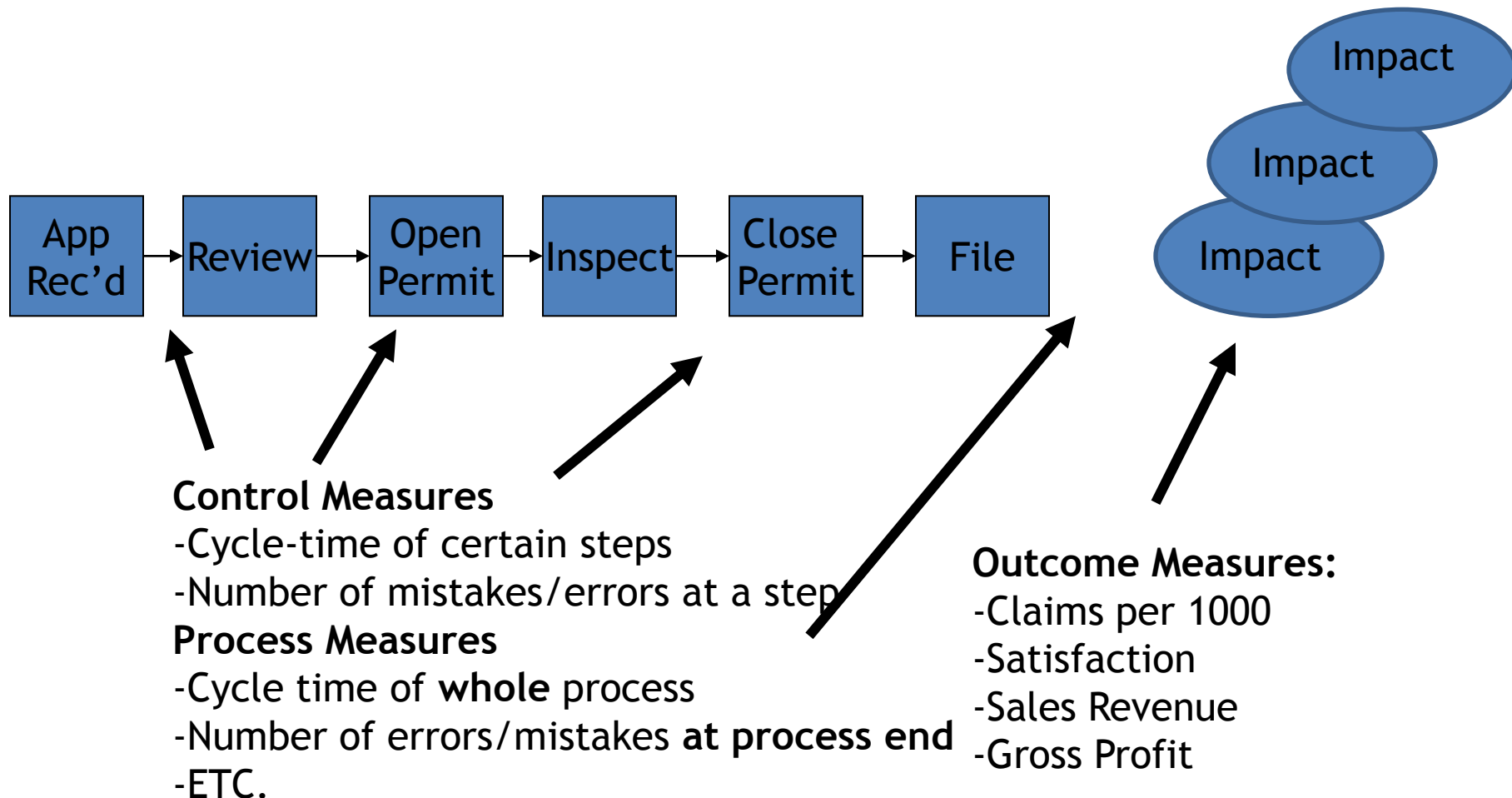• Act on exceptions

Change

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Evaluation Objectives

- Limit variation in process as much as possible

- Understand predictable range of variation

- Understand sources of variation

- React to trends rather than isolated events
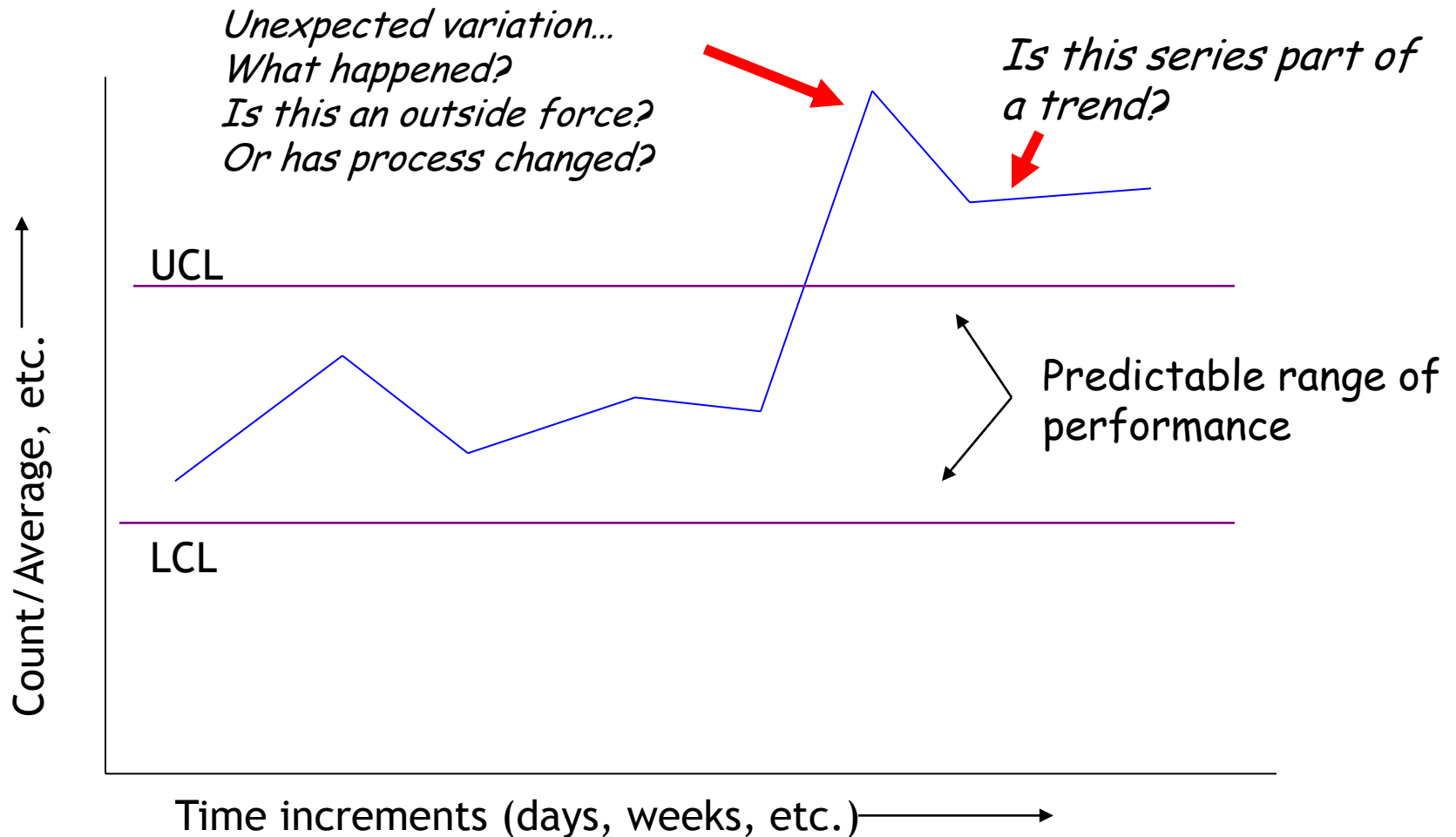
- Incrementally improve

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Types of Indicators

App Rec'd → Review → Open Permit → Inspect → Close Permit → File

Impact
Impact
Impact

Control Measures
-Cycle-time of certain steps
-Number of mistakes/errors at a step
Process Measures
-Cycle time of **whole** process
-Number of errors/mistakes **at process end**
-ETC.

Outcome Measures:
-Claims per 1000
-Satisfaction
-Sales Revenue
-Gross Profit

Control Chart for Evaluation

Unexpected variation...
What happened?
Is this an outside force?
Or has process changed?

Is this series part of a trend?

UCL

Count/Average, etc.

Predictable range of performance

LCL

Time increments (days, weeks, etc.)

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Trend Chart for Evaluation

Positive Tests Per Month

Legend:
- Count/Volume
- Running Average
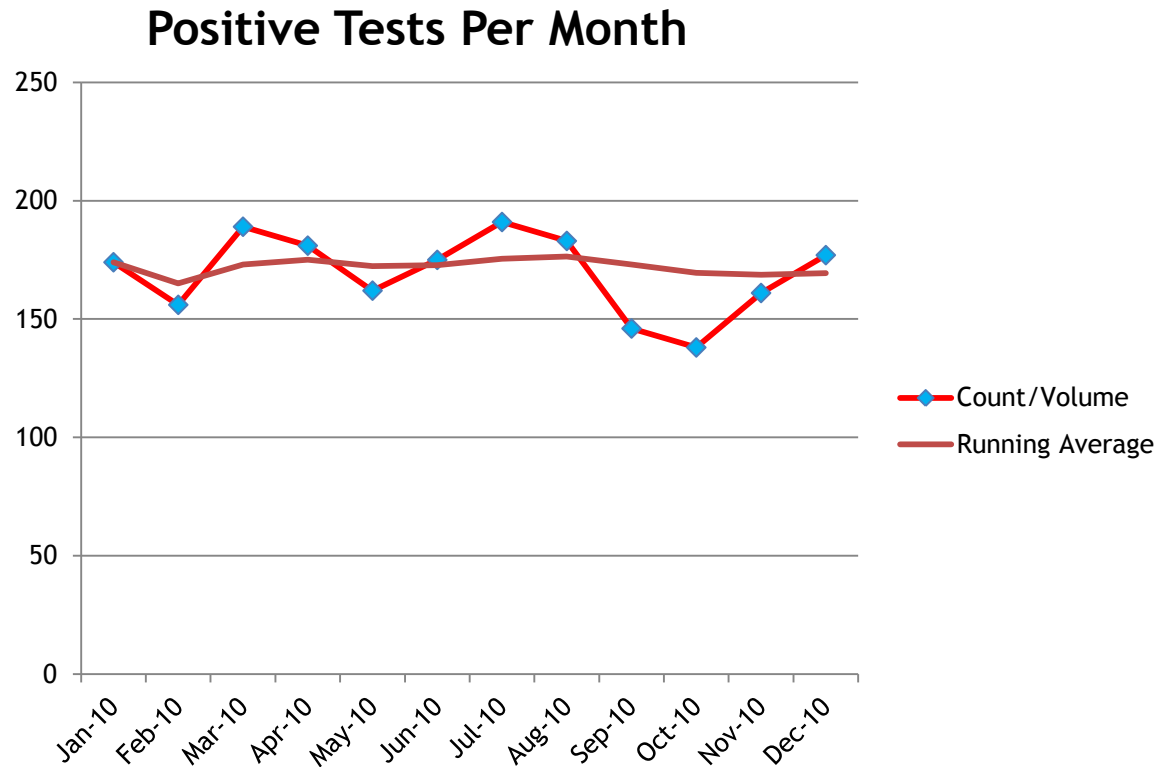
A trend chart requires fewer data points than a control chart and provides similar information

Box Plots for Evaluation

Hours to complete task per unit by month
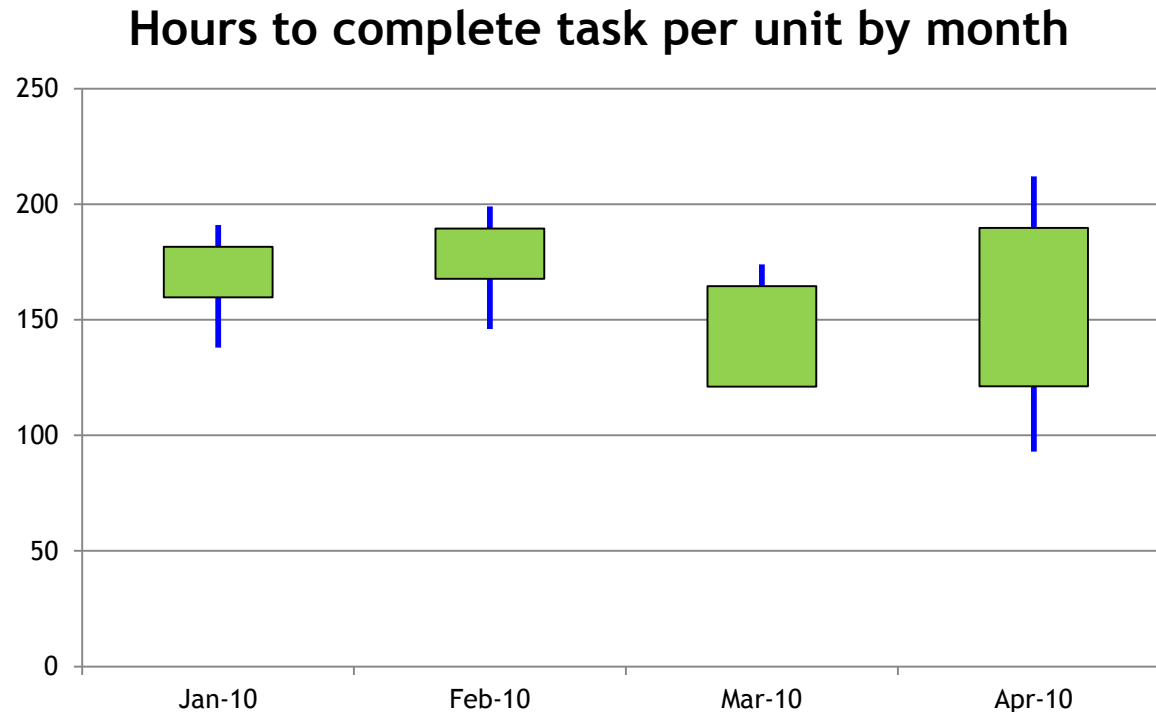
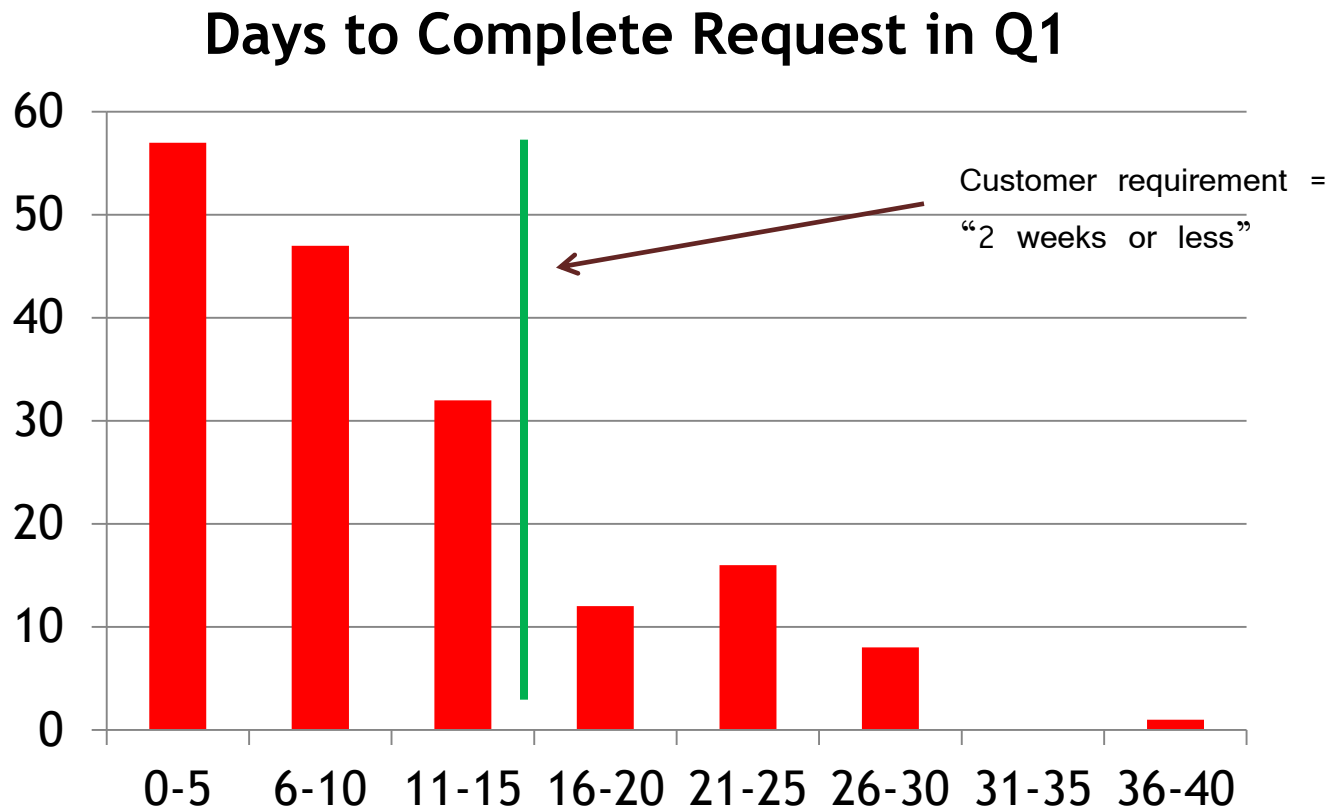*A box plot used in this way will show you variation over time, but also variation within a sample. If you just know the average over time, but not the variation within a given time period, you might miss something important.*

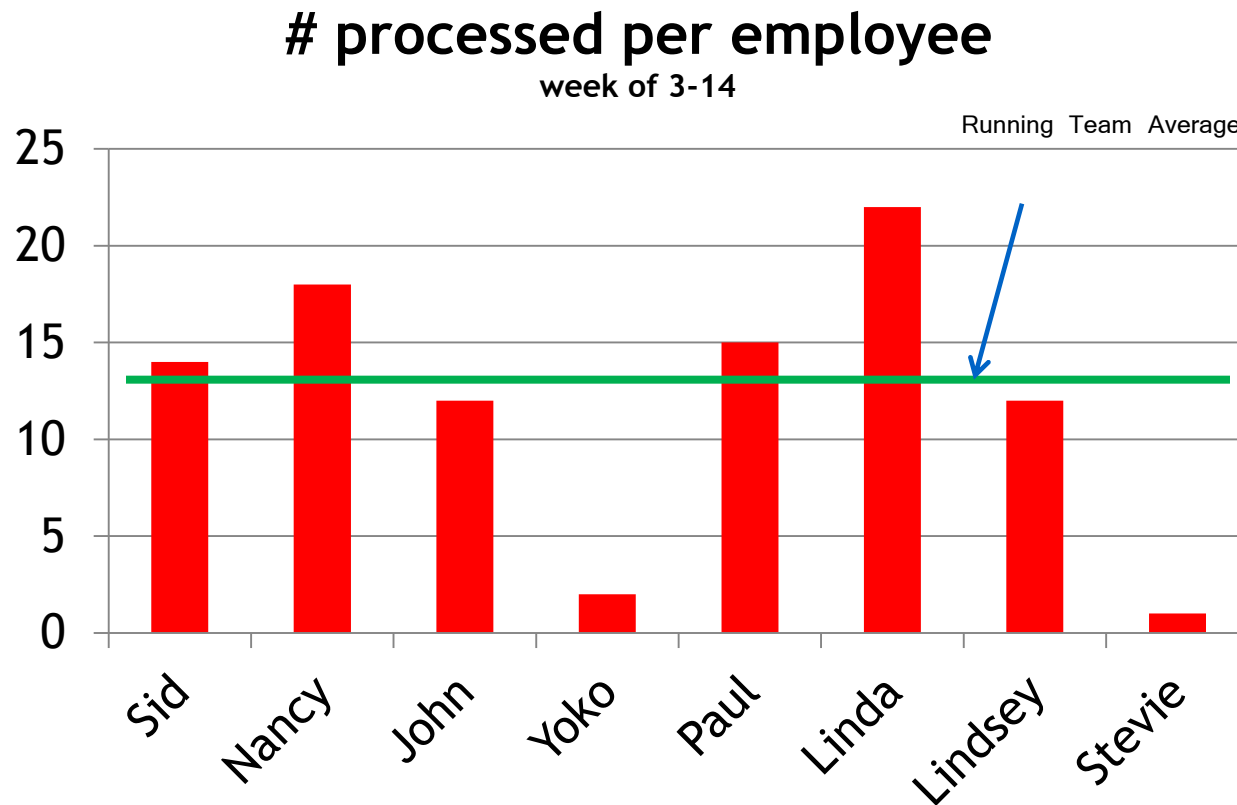# Public Health Performance Management Centers for Excellence

Days to Complete Request in Q1

Customer requirement = "2 weeks or less"

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Bar Chart for Evaluation

processed per employee
week of 3-14

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Accountability and Responsibility

It is not enough just to measure!

- **Who** is responsible for maintaining, formatting, and distributing the data?
- **Who** is responsible for taking action on variances and bad trends?
- **Who** is accountable for ensuring that these things take place?
- **Who** is accountable to ensure process is continually improved?

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Process Audits

- Audits can be time and labor intensive; bureaucratic

- Routine measurement and management is superior way to ensure quality control

- Scheduled audits may be required if control of process is "soft" and/or if difficult to put routine measurement in place

- Project teams/Process Owners may schedule follow-up audits to ensure process is being maintained

Quality Improvement in Public Health ~ Objectives

- Understand basic method for Quality Improvement Projects

- Understand purpose and value of common QI tools, including Pareto diagrams, histograms and flow charts

- Simulate the group process and analytical approach of a QI project

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References

- <u>The Team Handbook</u>, Peter Scholtes, Joiner Press, 1988

- <u>The Memory Jogger</u>, and <u>The Memory Jogger Plus</u>, Michael Brassard, Goal QPC Press, 1989

- <u>The Public Health Quality Improvement Handbook</u>, Bialek, Duffy, Moran, ed's, ASQ Press, 2009

- <u>The Improvement Guide</u>, Langley et al. Jossey-Bass, 1996.

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